PATENT

INSTITUT FRANCAIS DU PETROLE

PROCESS FOR IMPROVING THE POUR POINT OF FEEDS CONTAINING PARAFFINS USING A CATALYST BASED ON A BRIDGED DIOCTAHEDRAL 2:1 PHYLLOSILICATE

Eric BENAZZI and Nathalie MARCHAL-GEORGE

ABSTRACT

The invention concerns a process for improving the pour point of a feed comprising paraffins containing more than 10 carbon atoms, in which the feed to be treated is brought into contact with a catalyst comprising at least one dioctahedral 2:1 phyllosilicate, preferably synthesised in a fluoride medium in the presence of the acid HF and/or a further source of fluoride anions, and preferably wherein the interplanar spacing is at least 20 x 10^{-10} m (2 nm) and comprising pillars based on at least one oxide of elements from groups IVB, VB, VIB, VIII, IB, IIB, IIA or IVA or any combination of these oxides, preferably selected from the group formed by SiO_2, Al_2O_3, TiO_2, ZrO_2 and V_2O_5, or any combination of these latter, and at least one hydrodehydrogenating element in the metallic form. The process is carried out at a temperature in the range 170°C to 500°C, a pressure in the range 1 to 250 bar and at an hourly space velocity in the range 0.05 to 100 h^{-1}, in the presence of hydrogen in an amount of 50 to 2000 l/l of feed. The oils obtained have good pour points and high viscosity indices (VI). The process is also applicable to gas oils and to other feeds requiring a reduction in their pour point.

The present invention concerns a process for improving the pour point of feeds containing straight chain and/or slightly branched, long chain (more than 10 carbon atoms) paraffins, in particular to provide good yields on converting feeds with high pour points into at least one cut with a low pour point and a high viscosity index.

PRIOR ART

High quality lubricants are of fundamental importance to the proper operation of modern machines, automobiles and trucks. However, the quantity of paraffins originating directly from untreated crude oil with properties that are suitable for use in good lubricants is very low with respect to the increasing demand in this sector.

Heavy oil fractions containing large amounts of straight chain or slightly branched paraffins must be treated in order to obtain good quality oil bases in the best possible yields, employing an operation that aims to eliminate the straight chain or slightly branched paraffins from feeds which are then used as base stock, or as kerosene or jet fuel.

High molecular weight paraffins that are straight chain or very slightly branched and are present in the oils or kerosene or jet fuel lead to high pour points and thus to coagulation for low temperature applications. In order to reduce the pour points, such straight chain paraffins that are not or are only slightly branched must be completely or partially eliminated.

That operation can be carried out by extracting with solvents such as propane or methyl ethyl ketone, termed dewaxing, with propane or methyl ethyl ketone (MEK). However, such techniques are expensive, lengthy and not always easy to carry out.

A further technique is catalytic treatment; zeolites are among the most widely used catalysts because of their form selectivity.

Zeolite based catalysts such as ZSM-5, ZSM-11, ZSM-12, ZSM-22, ZSM-23, ZSM-35 and ZSM-38 have been described for their use in such processes.